Lesson Plans

Year 8 Mathematics   TERM 4

Some general points about the following lesson plans:

★ The lesson plans outline only one way of sequencing the learning material in each chapter of the textbook.

★ The content and sequence will obviously vary from class to class (The following guide is ambitious in many instances).

★ All activities and investigations in each chapter have been deliberately designed to support the National Curriculum content whilst keeping in mind the development and reinforcement of skills required in the study of mathematics in Year 11/12.

★ The length of lessons vary from school to school and even within schools. The following guide is based on 35/40 min lessons because it was reasoned that adjustment to 60/75/90 mins lessons would be easier than reducing lesson plans.

★ Students may be challenged further by completing each chapter Task, Competition Questions, and by finding and entering any of the many competitions, challenges, projects etc that may be found on the Internet. Such students may benefit by doing an Internet search early in the year and planning entries before they some of them close.

Assessment

A task	7th week of Term
Mental computation	Last week of Term
End of Term Test	Last week of Term

Summary of Term 4 Lessons (10 weeks)

Chapter 11	Ratio & Rate	Number & Algebra - Real Numbers	2 weeks
Chapter 12	Linear Equations	Number & Algebra - Linear & Non-linear	2 weeks
Chapter 13	Data	Statistics & Probability - Data Representation	2 weeks
Chapter 14	Time	Measurement & Geometry - Units of Measmnt	2 weeks
Chapter 10	Review	Review all of above	2 weeks

Note: The workprogram contains a detailed mapping of curriculum content.

Year 8 Level Description

The proficiency strands Understanding, Fluency, Problem Solving and Reasoning are an integral part of mathematics content across the three content strands: Number and Algebra, Measurement and Geometry, and Statistics and Probability. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics.

At this year level:
- **Understanding** includes describing patterns in uses of indices and repeating decimals, identifying commonalities between operations with algebra and arithmetic, connecting rules of relations and functions and their graphs, explaining the function of statistical measures, and contrasting measurements of perimeter and area.
- **Fluency** includes calculating accurately with simple decimals, indices and integers, recognising equivalence of common decimals and fractions including repeating decimals, factorising and simplifying basic algebraic expressions, evaluating perimeters, areas and volumes of common shapes, and calculating the mean and median of small sets of data.
- **Problem Solving** includes formulating and modelling, with comparisons of ratios, profit and loss, authentic situations involving areas and perimeters of common shapes and analysing and interpreting data using two-way tables.
- **Reasoning** includes justifying the result of a calculation or estimation as reasonable, explaining formal and intuitive use of ratios for comparing rates and prices, deriving one probability from its complement, using congruence to deduce properties of triangles, and making inferences about data.

Year 8 Content Description

Chapter 16　　　Linear Relationships　(Number & Algebra ➡ Linear & Non-linear Relationships)
★　Plot linear relationships on the Cartesian plane.
★　Plot points for tables of values from non-rule-based data.
★　Solve linear equations using algebraic and graphical techniques.
★　Use variables to symbolise simple linear equations.

Chapter 17　　　Measurement　(Measurement & Geometry ➡ Units of Measurement)
★　Find perimeters and areas of parallelograms, rhombuses and kites.
★　Explore the use of parallelograms, rhombuses and kites in art and architecture.
★　Develop the formulas for volumes of rectangular and triangular prisms and prisms in general.
★　Use formulas to solve problems involving volume.
★　Investigate the relationship between volumes of rectangular and triangular prisms.

Chapter 18　　　Probability　　　　　　　(Statistics & Probability ➡ Chance)
★　Understand that representing data in Venn diagrams or two-way tables facilitates the calculation of probabilities.
★　Use Venn diagrams and two-way tables to calculate probabilities for events satisfying 'and', 'or', 'given' and 'not' conditions.
★　Pose 'and', 'or', 'not' and 'given' probability questions about objects or people.
★　Collect data to answer the questions using Venn diagrams or two-way tables.

Chapter 19　　　Congruence　　　　　　　(Measurement & Geometry ➡ Geometric Reasoning)
★　Develop the conditions for congruence of triangles.
★　Construct triangles using the conditions for congruence.
★　Solve problems using the properties of congruent figures.
★　Establish of the conditions for congruence (SSS, SAS, ASA and RHS) to solve problems.
★　Establish the properties of squares, rectangles, parallelograms, rhombuses, trapeziums and kites.

Chapter 20　　　Review
★　Review all of above

Chapter 16 Linear Relationships (Number & Algebra ➡ Linear & Non-linear)

★ Plot linear relationships on the Cartesian plane.
★ Plot points for tables of values from non-rule-based data.
★ Solve linear equations using algebraic and graphical techniques.
★ Use variables to symbolise simple linear equations.

Lesson	Method	Resources
1	☐ General (covering book, ruling pages, paste study guide etc.) ☐ Purpose of chapter ☐ Exercise 16.1 p214 ☐ Exercise 16.2 p215 ☐ HW: Read and practice the Sweet Trick on p225	
2	☐ Exercises 16.3 p216 (Model solutions) ☐ Some students demonstrate the Sweet Trick p157 ☐ HW: Complete Exercises and demonstrate Sweet Trick at home/lodgings	graph paper?
3	☐ Discussion about Sweet Trick - how to improve presentation ☐ Exercises 16.4 p217 (Model solutions) ☐ Exercises 16.5 p218 (Model solutions) ☐ HW: Complete Exercises	graph paper?
4	☐ Exercise 16.6 p219 (Model solutions) ☐ HW: Complete exercise	graph paper?
5	☐ Discussion of why employers are adamant that employees have adequate mental computation skills - also very useful revision technique ☐ Mental computation Exercise 16.8 p221 ☐ Exercise 16.7 p220 (Model solutions) ☐ HW: Complete exercise	graph paper?
6	☐ Mental computation Exercise 16.9 p221 Group work working on a directed/choice/combination of: ☐ Investigation 16.1, 16.2 p224 ☐ A game p225 ☐ Technology 16.1, 16.2, 16.3, 16.4 p158	graph paper? graphics calculator Internet
7	☐ Mental computation Exercise 16.10 p221 Group work working on a directed/choice/combination of: ☐ Investigation 16.1, 16.2 p224 ☐ A game p225 ☐ Technology 16.1, 16.2, 16.3, 16.4 p158	
8	☐ NAPLAN Questions p222 (Model solutions) ☐ Competition Questions p223 (Model solutions) ☐ HW: Complete Questions	
9	☐ Chapter Review 1 p227 ☐ HW: Complete Chapter Review	
10	☐ Chapter Review 2 p228 ☐ HW: Complete Chapter Review	

Chapter 17 Measurement   (Measurement & Geometry ➡ Units of Measurement)

★ Find perimeters and areas of parallelograms, rhombuses and kites.
★ Explore the use of parallelograms, rhombuses and kites in art and architecture.
★ Develop the formulas for volumes of rectangular and triangular prisms and prisms in general.
★ Use formulas to solve problems involving volume.
★ Investigate the relationship between volumes of rectangular and triangular prisms.

Lesson	Method	Resources
1	☐ Purpose of chapter ☐ Exercise 17.1, 17.2 p230 ☐ Exercise 17.3 p231 (Model solutions) ☐ HW: Read and practice the Sweet Trick on p242	
2	☐ Short mental test 9 times table - repeat as necessary ☐ Exercise 17.4 p232 (Model solutions) ☐ Some students demonstrate the Sweet Trick p242 ☐ HW: Complete Ex 17.4 and demonstrate Sweet Trick at home/lodgings	
3	☐ Discussion about Sweet Trick - how to improve presentation ☐ Exercise 17.5 p233 (Model solutions) ☐ HW: Complete exercise	
4	☐ Exercise 17.6 p234 (Model solutions) ☐ HW: Complete exercise	
5	☐ Discussion of why employers are adamant that employees have adequate mental computation skills - also very useful revision technique ☐ Mental computation Exercise 17.9 p237 ☐ Exercise 17.7 p235 (Model solutions) ☐ HW: Complete exercise	
6	☐ Mental computation Exercise 17.10 p237 ☐ Exercise 17.8 p236 (Model solutions) ☐ HW: Complete exercise	
7	☐ Mental computation Exercise 17.11 p237 Group work working on a directed/choice/combination of: ☐ Investigation 17.1, 17.2, 17.3, 17.4, 17.5, 17.6 p240 ☐ A game p242 ☐ Technology p241 ☐ HW: A couple of puzzles p242	rulers scissors
8	☐ NAPLAN Questions p238 (Model solutions) ☐ Competition Questions p239 (Model solutions) ☐ HW: Complete NAPLAN Questions	
9	☐ Chapter Review 1 p243 ☐ HW: Complete Chapter Review	
10	☐ Chapter Review 2 p244 ☐ HW: Complete Chapter Review	

Chapter 18 Probability   (Statistics & Probability ➡ Chance)

★ Understand that representing data in Venn diagrams or two-way tables facilitates the calculation of probabilities.
★ Use Venn diagrams and two-way tables to calculate probabilities for events satisfying 'and', 'or', 'given' and 'not' conditions.
★ Pose 'and', 'or', 'not' and 'given' probability questions about objects or people.
★ Collect data to answer the questions using Venn diagrams or two-way tables.

Lesson	Method	Resources
1	☐ Purpose of chapter ☐ Exercise 18.1 p246 ☐ HW: Read and practice the Sweet Trick on p256	
2	☐ Exercise 18.2 p247 ☐ Some students demonstrate the Sweet Trick p256 ☐ Set up A Game p256 ☐ HW: Complete Exercise and demonstrate Sweet Trick at home/lodgings	
3	☐ Discussion about Sweet Trick - how to improve presentation ☐ Exercise 18.3 p248 ☐ Play A Game p256 ☐ HW: A couple of puzzles p255	
4	☐ Exercise 18.4 p249 (Model solutions) ☐ HW: Complete exercise	coins
5	☐ Mental computation Exercise 18.6 p251 ☐ Exercise 18.5 p250 (Model solutions) ☐ HW: Complete exercise	
6	☐ Mental computation Exercise 18.7 p251 Group work working on a directed/choice/combination of: ☐ Investigation 18.1, 18.2 p254	dice matches
7	☐ Mental computation Exercise 18.8 p251 Group work working on a directed/choice/combination of: ☐ Investigation 18.1, 18.2 p254	dice matches
8	☐ NAPLAN Questions p252 (Model solutions) ☐ Competition Questions p253 (Model solutions) ☐ HW: Complete NAPLAN Questions	
9	☐ Chapter Review 1 p257 ☐ HW: Complete Chapter Review	
10	☐ Chapter Review 2 p258 ☐ HW: Complete Chapter Review	

Chapter 19 Congruence   (Measurement & Geometry ➡ Geometric Reasoning)

★ Develop the conditions for congruence of triangles.
★ Construct triangles using the conditions for congruence.
★ Solve problems using the properties of congruent figures.
★ Establish of the conditions for congruence (SSS, SAS, ASA and RHS) to solve problems.
★ Establish the properties of squares, rectangles, parallelograms, rhombuses, trapeziums and kites.

Lesson	Method	Resources
1	☐ Purpose of chapter ☐ Exercise 19.1 p260 ☐ Exercise 19.2 p261 ☐ Exercise 19.3 p261 ☐ HW: Read and practice the Sweet Trick on p272	ruler compass
2	☐ Exercise 19.4 p262 ☐ Exercise 19.5 p262 (Model solutions) ☐ A couple of puzzles p272 ☐ HW: Complete Exercises and demonstrate Sweet Trick at home/lodgings	ruler compass
3	☐ Discussion about Sweet Trick ☐ Technology 19.6 p263 (Model solutions) ☐ HW: Complete exercise, Competition 1-2 p269	
4	☐ Exercise 19.7 p264 (Model solutions) ☐ HW: Complete exercise, A couple of puzzles 3 p272	
5	☐ Mental computation Exercise 19.10 p267 ☐ Exercise 19.8 p265 (Model solutions) ☐ HW: Complete exercise	
6	☐ Mental computation Exercise 19.11 p267 ☐ Exercise 19.9 p266 (Model solutions) ☐ HW: Complete exercise	
7	☐ Mental computation Exercise 19.12 p267 Group work working on a directed/choice/combination of: ☐ Investigation 19.1, 19.2, 19.3 p270 ☐ A game p272 ☐ Technology 19.1, 19.2, 19.3 p271	Internet rulers
8	☐ NAPLAN Questions 3-7 p268 (Model solutions) ☐ Competition Questions p269 (Model solutions) ☐ HW: Complete NAPLAN Questions	
9	☐ Chapter Review 1 p273 ☐ HW: Complete Chapter Review	
10	☐ Chapter Review 2 p274 ☐ HW: Complete Chapter Review	

A Task

Work on one of the four tasks at the beginning of each chapter.
(Page 213, page 229, page 245, page 259)

Lesson	Method	Resources
1-5	☐ Setup ☐ Decide whether tasks completed individually, groups of two, three, or four ☐ Decide which tasks are assigned to individuals/groups ☐ Decide how tasks are to be presented: Oral presentation, poster presentation (on classroom wall), power point presentation etc. ☐ If the presentation will take class time then decide when. ☐ Each lesson may be started with a mental computation or a summary of what is expected from the work on the tasks.	Textbook Assesssment instruments

Chapter 20 Review

Chapter 16   Linear Relationships (Number & Algebra ➡ Linear & Non-linear Relationships)
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Chapter 19   Congruence   (Measurement & Geometry ➡ Geometric Reasoning)
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Lesson	Method	Resources
1-10	☐ Purpose of Review ☐ Review 1 p276 ☐ Review 2 p279 ☐ Repetition of above until mastery? ☐ Sample end of term papers (www.drdwyer.com.au) ☐ Assessment	Textbook Assesssment instruments